

REMARKS

The present invention relates to an apparatus and method of controlling frequency assignment in virtual single cell (VSC) communications networks. Typically, VSC networks comprise a plurality of spaced-apart radio heads operable to communicate with mobile terminals on one or more frequencies, and a controller. In conventional systems, the controller performs a soft-handoff of a mobile terminal from a serving radio head to a target radio head whenever the mobile terminal crosses a cell boundary. In soft-handoff, the frequency over which the mobile terminal is communicating does not change as a result of the handoff. This differs from hard-handoff, where the target radio head is assigned another frequency to communicate with the mobile terminal. However, the radio heads are typically within close proximity of one another. Therefore, it is possible that other radio heads using the same frequency to communicate with other mobile terminals may interfere with communications between the mobile terminal and the target radio head after handoff. Thus, the present invention determines, prior to the handoff, whether any of the radio heads in the network would interfere with the communications after handoff, and bases handoff type (e.g., soft or hard) on this determination.

The Examiner rejected claim 1 under 35 U.S.C. § 103(a) as being anticipated by the patent to Greene in view of the patent to Mimura. Applicant has cancelled claims 1-14 without prejudice, and replaced them with claims 15-39. Claims 15-39 do not add new matter, but merely clarify the claim language.

New claim 15 requires "performing a soft-handoff to the target radio head if the one or more neighbor radio heads would not interfere with the communications on the first communication channel ... and ... performing a hard-handoff to the target radio head if the one or more neighbor radio heads would interfere with the communications on the first communication channel." The Examiner admits that Greene does not teach or suggest executing a soft-handoff or a hard-handoff based on whether a target radio head (i.e., "said

other radio head" in now-cancelled claim 1) is "denied use" of a selected frequency. However, the Examiner asserts that Mimura does. Applicant respectfully disagrees.

Mimura discloses a method of improving communications in a CDMA system. However, unlike the requirements of claim 15, the method of Mimura is based on channel occupancy. When a mobile terminal is to be handed-off in Mimura, a controller will check, at the destination base station, the channel occupancy of the radio frequency (i.e., the number of assigned users) currently being used by the mobile terminal. If the number of users exceeds a predetermined threshold, the mobile terminal is assigned a different frequency on which to communicate with the destination base station. Otherwise, the mobile terminal may continue to communicate with the destination base station on the same frequency. See *Mimura*, col. 13, ln. 36 – col. 14, ln. 41. However, basing handoff type on channel occupancy does not teach or suggest, performing a soft-handoff or a hard-handoff based on a determined interference. It simply means that there are too many users already assigned to the target channel. Indeed, the controller of Mimura simply endeavors to equalize the number of users across the available frequencies. Therefore, neither Greene nor Mimura teach or suggest, alone or in combination, claim 15. Accordingly, Applicants respectfully request the allowance of new claim 15, and its dependent claims 16-21.

New claim 22 requires "assigning the first frequency to the target radio head if the one or more neighbor radio heads would not interfere with the communications on the first frequency ... and ... assigning a second frequency to the target radio head if the one or more neighbor radio heads would interfere with the communications on the first frequency." For reasons similar to those stated above with respect to claim 15, neither Greene nor Mimura teach or suggest, alone or in combination, claim 22. Accordingly, Applicants respectfully request the allowance of new claim 15, and its dependent claims 23-28.

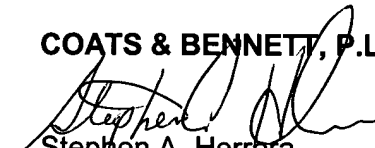
Claims 29 and 32 contain language similar to that of claims 15 and 22, respectively. As such, both Greene and Mimura, alone or in combination, fail to teach or suggest claims 29 and

32 for reasons similar to those stated above. However, the Examiner also cited the patent to Royer in addition to Greene and Mimura when rejecting (now cancelled) claims 12 and 14. However, it appears that Royer is added because it allegedly teaches storing indications of interference between radio heads in memory. Even if one were to accept this assertion as true, Royer still does not teach or suggest, alone or in combination with Greene and/or Mimura, performing a handoff type, or assigning a frequency based on whether communications will be interfered with after handoff. Accordingly, Applicant respectfully requests the allowance of claims 29 and 32, as well as their respective dependent claims 30-31 and 33-35.

Respectfully submitted,

COATS & BENNETT, P.L.L.C.

By:


Stephen A. Herrera
Registration No. 47,642

Dated: June 7, 2004

P.O. Box 5
Raleigh, NC 27602
Telephone: (919) 854-1844